

ON SOME NEW SPECIES OF AFRICAN MOSQUITOS (CULICIDAE)

BY

R. NEWSTEAD, M.Sc., A.L.S., ETC.,

AND

HENRY F. CARTER,

ASSISTANT ENTOMOLOGIST, LIVERPOOL SCHOOL OF TROPICAL MEDICINE

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Three of the Anopheline mosquitos described herein formed part of the collections made by our colleague, Dr. Allan Kinghorn, and Mr. R. E. Montgomery during their expedition to Zambesi in 1908, on behalf of the Liverpool School of Tropical Medicine. In addition to these there were also present in the collection examples of *Myzomyia funesta*, *Myzorhynchus mauritianus*, and of the Culicines *Aporoculex punctipes*, *Mansonia major*, *M. uniformis*, and a species of *Chrysococonops*, which may prove to be new.

Neocellia (?) *christyi* was presented to the School by Dr. Christy some years ago. It is a very striking species, but we cannot from the single specimen be quite certain as to whether it is correctly placed in the genus *Neocellia*.

Cellia squamosa var. *arnoldi* has already been referred to by Stephens and Christophers (1908), as *Cellia arnoldi*, and the characteristics of the egg and larva are now given below.

Dr. A. S. Donaldson made an extensive collection of mosquitos while stationed at Broomässie, Ashanti, during the years 1907-1909. It has been our intention to publish a list of his captures, which would add considerably to our knowledge of the mosquitos of this region, but we have thought it desirable to defer this for a future publication. Two new species were found among those he

collected; *Cellia cincta*, described in a previous number of these Annals (1910), and *Reedomyia simulans* described below. We take this opportunity of expressing, on behalf of the School, our best thanks for the valuable material which he was pleased to present to us.

Pyretophorus distinctus, n. sp.

Under pocket lens $\times 16$.

Head.—White in front, yellowish in the centre and darker behind; palpi black, with four whitish bands, the apex white; proboscis black, with the labella pale yellowish brown.

Thorax.—Slaty grey in the middle with a dark median longitudinal line, yellowish-brown laterally; scutellum rather paler in colour than the thorax; pleurae greyish brown.

Abdomen.—Dark brown, with pale golden brown hairs.

Legs.—Femora and tibiae uniformly brown, rather paler beneath; fore legs with distinct but very narrow white apical bands on the metatarsus and first tarsal segments; middle and hind legs with minute pale areas at the articulations.

Wings.—Costa mostly black, with two pale spots extending on to the first longitudinal vein; fringe with pale areas at the apices of the veins.

Microscopical characters.

Head.—Integument dark grey to black, densely covered with upright forked scales, those in front being pure white, those in the median area yellow, and those behind black; projecting from the centre of the anterior portion of the head is a tuft of long white scales and at the margins of the eyes laterally, from four to five dark bristles. *Antennae* grey, the basal segment pale yellow; the second, third and fourth segments with a few white scales. *Clypeus* black. *Palpi* of four segments clothed with very dark brownish grey scales and with an apical band to each segment, the band at the apex of the first being very small and yellowish, the others white. *Proboscis* black, with the labella pale.

Thorax.—With a median longitudinal groove and with two pronounced lateral ridges. Between these ridges the integument is of a slaty grey colour, and on either side of them, dark reddish brown. Anterior area of thorax with a mass of long, thin white

scales, some of which project over the nape, remaining portion clothed with golden narrow curved scales. *Scutellum* denuded, grey in the centre, pale yellowish brown laterally. *Metanotum* dark brown, pleurae rather paler brown. *Halteres* with very pale stems and dark apices.

Abdomen.—Dark brown, with pale golden brown hairs.

Legs.—Brown, femora pale ventrally; first pair of legs with two distinct apical bands on the metatarsus and first tarsal segment, remaining segments of fore legs and also those of the middle and hind legs with pale articulations.

Wings.—With the veins clothed with rather long, thin, black and yellow lanceolate scales; *the costa deep black*, with two pale areas, one apical and the other on the distal half just above the base of the first sub-marginal cell; *sub-costa* black. First longitudinal vein pale at the base, with five black spots, the apical and two basal ones being the smallest. The second long vein mostly pale, there being two small dark spots immediately before and after the supernumerary cross vein respectively; the upper branch of the cell with a small basal and a large apical spot, the lower branch similar. Third longitudinal vein with a small apical spot and two basal ones almost directly under those on the second long vein. Fourth vein for the greater part pale scaled but with a fairly large, dark area just after the base of the fork; both branches of the cell with two dark patches of scales. Fifth vein with two dark scaled areas, the larger near the centre and extending a considerable distance beyond the junction of the branch, the smaller situated near the apex of the vein, the branch with three spots, one apical and two basal. Sixth vein with three dark patches. Fringe with nine pale areas, situated at the apices of the veins and branches. First cell considerably longer than the second, posterior cross vein about twice its own length distant from the mid vein.

Length.—4·5 mm.

Habitat.—Luapula river, below Chingola's village, N. E. Rhodesia, 17/9/07. (Dr. A. Kinghorn.)

This Anopheline may easily be distinguished by the dense black *costa*, which is strikingly characteristic, and also unique among the members of this genus.

Pyretophorus distinctus var. *melanocosta*, n. var.

This differs from *P. distinctus* in having the *whole of the costa black*, with the exception of the small pale apical spot. There are also other differences, the chief being that the small spot on the apex of the basal segment of the palp is not present; on the first long vein also there are six dark areas as compared with five in *P. distinctus*. The position of the posterior cross vein also differs, it being about its own length distant from the mid cross vein.

Habitat.—Luapula river below Chingola's village, N. E Rhodesia, 17/9/'07. (Dr. A. Kinghorn.)

Cellia pseudosquamosa, n. sp.

Under lens \times 16.

Head, white in front, black posteriorly; palpi, dark with three white bands and a small basal spot; on the dorsal surface is a white line running from the apex to the basal spot.

Thorax, dark with two large black ocelli, one on either side of the median line and situated on the anterior portion at a distance of about one-third the length of the thorax; clothed with numerous white scales.

Abdomen, dark brown with dark lateral tufts; last two segments white.

Legs, dark brown, the femora and tibiae mottled, metatarsi and tarsi unbanded.

Wings, dark, very densely scaled; costa with two small and three larger white spots.

Microscopical characters.

Head, dark, very thickly covered with upright forked scales, those at the base black, the rest pure white. A tuft of long white scales projects forwards between the eyes and several dark bristles also extend outwards from the anterior and lateral portions of the head. *Antennae*, dark, the basal segments with a few white scales. *Clypeus*, dark. *Palpi*, with dense brown scales, and white apical bands to the segments, the basal band very small; the upper surface has a thick line of white scales along almost the whole of its length, which gives the two apical segments the appearance of being entirely white. *Proboscis*, black.

Thorax.—Integument dark greenish brown; with two large black ocelli, covered with rather small white spindle shaped scales.

Prothoracic lobes, with outstanding black and white scales. *Scutellum*, dark with white spindle shaped scales. *Pleurae*, paler than thorax with three white longitudinal lines. *Metanotum*, dark. *Halteres*, with pale yellowish stems and dark apices. *Abdomen*, dark brown, densely clothed with long irregular scales, those on the last two segments being white. There are also a few scattered white ones on the 6th, 7th, and also the basal segments; the dark apical lateral tufts are not present on the 7th, 8th and 9th segments. *Venter*, dark with numerous scattered white scales.

Legs, dark brown, unbanded. Femora and tibiae dark, mottled with white, pale ventrally; the basal half of the metatarsus also shows traces of mottling.

Wings with large black and white lanceolate scales, the greater portion of the wing being dark. Costa black with five white spots, the two smaller basal ones not extending on to the first longitudinal vein, the third being represented on this vein by a few white scales. The first longitudinal has, besides those already mentioned, a small white spot almost under the centre of the second black costal area, and another immediately before the posterior extremity of the third dark costal area; for a short distance at the base the vein is pale. Stem and upper branch of the second vein black, lower branch with two white scaled patches; third longitudinal vein mostly dark with several white scales intermingled with the black ones in the central portion. Fourth vein black; branches of cell with two pale spots and white scales intermingled with the remaining dark portion. Fifth vein with two pale areas on the upper branch and one just before the fork on the lower branch; stem with a white spot towards the apex, base white. Sixth vein with three pale and three dark scaled areas. Wing fringe composed of dark scales but with a few pale scales at the apices of the first longitudinal vein, and the upper branch of the second long vein.

Length.—5·5 mm.

This description was drawn up from a single perfect female, taken by Dr. Allan Kinghorn in North Eastern Rhodesia (Chinyanta's village, Luombwa river), and evidently is closely allied to *Cellia squamosa* Theob. From this, however, it can at once be separated by the unbanded tarsal segments and the somewhat different wing markings.

Cellia squamosa, var. *arnoldi*. (Newstead and Carter.)

Cellia arnoldi (Stephens and Christophers, 1908).

The only marked difference between typical examples of the imagines of *Cellia squamosa* and the var. *arnoldi* is that the latter has no trace of the white pleural lines; in all other respects the two insects are, so far as we can trace, identical. There is, however, a marked difference between the larvae of these insects. In the first place that of *C. squamosa*, according to Hill and Haydon has no branched hair on the antenna, indeed, this structure is apparently absent in many of the known African species of this genus. It would seem therefore that as the var. *arnoldi* has a well developed branched hair, that it may eventually be raised again to specific rank. There are also other differences, especially in the form and situation of the palmate hairs.

Ova (fig. 1), somewhat peculiar in form, the anterior extremity being considerably broader than the posterior. It is reddish brown in colour and about 0·5 mm. in length.

Larva (figs. 2, 3, 4).—Antenna with a distinct branched hair on the shaft; terminal hair missing.

Frontal hairs apparently the same as in *Cellia squamosa*, Theob.

Palmate hairs (fig. 4) rudimentary on the first and second abdominal segments, fully developed on the third to the seventh inclusive. In *C. squamosa* the hairs are all well developed on the abdomen, and there is also a rudimentary one on the thorax; the shape and number of the leaflets to each hair also differs from the latter species. In the var. *arnoldi* the filament is very short, and there is a larger number of leaflets.

Neocellia ? christyi, n. sp.

Under pocket lens \times 16.

Head.—Dark behind, creamy white in front; palpi dark brown with two white apical bands and a narrower creamy median basal band; proboscis black with the labella pale.

Thorax and scutellum black with creamy scales; metanotum black.

Abdomen dark with distinct pale spots laterally.

Legs brown, femora and tibiae pale beneath with apical banding to the tarsal segments.

Wings large and broad, very clearly spotted costa with five black spots, the second and third the largest, the basal one small and not extending on to the first longitudinal vein. Fringe with eight pale spots.

Microscopical characters.

Head black, clothed with creamy upright forked scales in front, dark ones behind, with a tuft of long irregular pale scales extending distally between the eyes, and with several short golden bristles projecting over the eyes laterally and anteriorly. *Antennae* dark with pale scales on the first few segments. *Palpi* with dark brown scales and with pale apical bands, the posterior pair small and creamy, the distal pair white. *Proboscis* dark.

Thorax.—Integument very dark grey, almost black, with deep cream coloured scales, which approximate more to the narrow curved than to those of the spindle-shaped type; anterior portion with long thin creamy-white scales projecting forward over the nape. *Scutellum* dark, somewhat paler laterally with scales similar to those on the thorax, and with numerous short golden bristles; metanotum black. *Halteres* testaceous with slightly darker apices, clothed with small flat scales of a dull golden brown colour.

Abdomen.—Integument almost black, with white, basal, lateral areas to the middle segments. Covered with long irregular golden brown scales and hairs; the basal segment with a median tuft of long golden bristles. *Venter* dark with a few white flat scales. *Legs* brown, the femora and tibiae covered with pale scales laterally and ventrally. Tarsi of the first and third pair of legs dark with fairly broad apical creamy bands, the last tarsal segment dark; mid-legs missing.

Wings much broader than is usual in Anopheline mosquitos, the hind margin being markedly arched, and the veins are somewhat thinly scaled. The costa with five dark areas, the third being much the largest, and all, with the exception of the small basal one, spreading on to the first long vein; the first and fourth evenly, the second interrupted by a few white scales in the centre, and the third by a small pale area towards the proximal end. The third and fourth spread evenly on to the sub-costa. Second vein with

a large dark patch at the base, upper branch all black except at the apex, lower with three dark spots; junction of the branches pale scaled. Third vein with three patches of black scales, two basal and one apical. Fourth longitudinal with two large dark areas, each branch with two spots. Fifth vein with three spots almost equidistant, the branch also with three, one at the apex, one immediately in front of the posterior cross-vein and the other at the base of the fork. Sixth vein with two dark areas. Wing fringe with eight pale areas, the first at the apex of the first long vein, the next at the apex of the lower branch of the second long vein, and the others at the apices of the veins.

Length 7 mm.

A single female of this curious *Anopheline* was taken in Uganda by Dr. C. Christy; according to scale structure it appears to belong to the genus *Neocellia*, Theobald, but in its general appearance it is strikingly distinct, and is also widely separated geographically, the members of the latter genus, as defined by Theobald, occurring only in India.

Reedomyia simulans, n. sp.

Under pocket lens $\times 16$.

Head black, with a brilliant white patch in front and a large pale area on each side. *Proboscis* black, with a small indistinct yellowish median band. *Palpi* about the same length as the proboscis with three bands, the two basal ones being little more than spots.

Thorax reddish brown, with two brilliant white shoulder-spots and two smaller ones towards the centre, one on each side of the middle line. *Scutellum* white; *pleurae* with five white patches.

Abdomen with basal and lateral spots; apical segment all white.

Legs.—*Femora* dark brown above, pale ventrally, each with an apical white spot and a small indistinct one a short distance before the apex; *tibiae* and *metatarsi* dark brown with apical bands; *tarsi* of the fore and mid-legs unbanded, the last two joints being pale dusky brown; those of the hind legs with broad apical bands, the last joint being entirely white.

Microscopical characters.

Head (fig. 5) with a triangular patch of silvery white and rather broadly curved scales in front, this patch of scales is

connected by a narrow median line of somewhat narrower curved scales, the latter finally expanding laterally at the base of the head. The remaining portion of the head is clothed with flat scales, the larger sub-median areas being composed of black ones, which, however, gradually merge into lateral basal patches of pure white ones; those scales bordering on the white areas are dark at the base and of a brownish yellow colour towards the apex; these pale areas are followed again with small patches of dark scales. Several upright forked black scales are present over the greater part of the head. Two long dark bristles project between the eyes and also several shorter ones over the lateral margins. *Antennae* testaceous with whorls of long dark hairs. *Palpi* (fig. 6) composed of four segments, slightly longer than the proboscis, and with three small pale bands; the band at the base of the apical segment is the most conspicuous and is composed of white scales, the others at the bases of the second and third are very small and yellowish. *Proboscis* black, with a pale yellow and somewhat indistinct band; *labella* yellowish.

Thorax reddish brown, covered with narrow curved scales, those on the anterior lateral area forming large white spots; almost immediately under these, towards the centre of the thorax, are two minute patches of similar scales. *Prothoracic lobes* clothed with white narrow curved scales similar to those forming the spots on the thorax; scutellum with white flat scales. *Pleurae* slightly paler in colour than the thorax, with five patches of white flat scales, one of which is situated immediately in front of the root of the wing and another of somewhat dusky scales immediately behind.

Abdomen dark brown with basal dusky white bands expanding laterally into large spots; the apical segment all white. *Venter* pale dusky brown, the last three segments with basal patches of white scales.

Legs.—*Femora* dark brown merging into black towards the apex, pale ventrally, and with two white spots, one being apical the other situated on the distal half; *tibiae* and *metatarsi* black with broad white apical bands. *Tarsi* of the fore and middle pairs dark, unbanded, the last two segments brownish yellow; the hind tarsi with broad apical bands on the first, second and third segments, the fourth being all white.

Wings with a white scaled spot at the extreme base of the costa; first fork cell longer and narrower than the second, their bases almost level; stem of the first sub-marginal cell rather more than half the length of the cell, that of the second posterior almost as long as the cell; posterior cross vein rather more than its own length distant from the mid-vein.

Length 3·5 mm.

Habitat.—Broomassie, Ashanti, W. Africa (Dr. A. S. Donaldson).

This pretty little mosquito comes nearer to *R. albopunctata*, Theob. than the other members of this genus, but differs from the latter in the thoracic ornamentation and the leg banding.

LITERATURE

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EXPLANATION OF PLATE XI.

Fig. 1.—Ova of *Cellia squamosa*, var. *arnoldi*.

Fig. 2.—Larval head of *Cellia squamosa*, var. *arnoldi*.

Fig. 2a.—Labial plate of same larva enlarged.

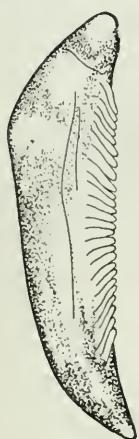
Fig. 3.—Lateral comb of larva, *Cellia squamosa*, var. *arnoldi*.

Fig. 4.—Palmate hair from third abdominal segment of larva,
Cellia squamosa, var. *arnoldi*.

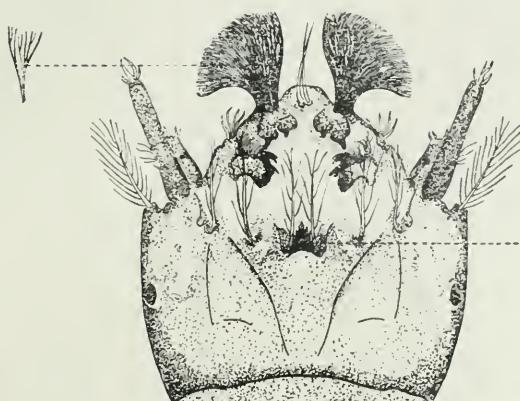
Fig. 5.—Cephalic scaling of *Reedomyia simulans*, n. sp.

Fig. 6.—Head and palpi of *Reedomyia simulans*, n. sp. ♂.

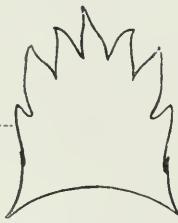
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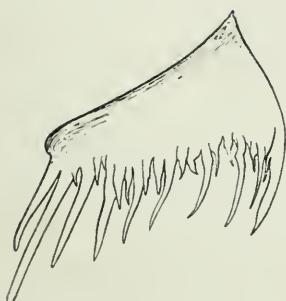
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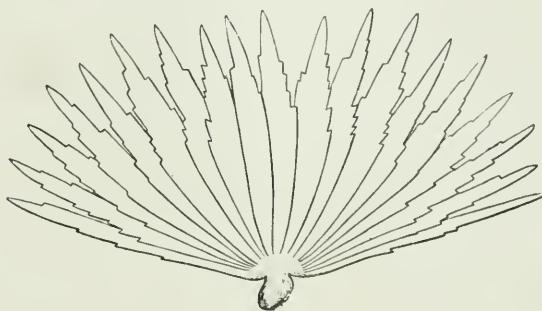
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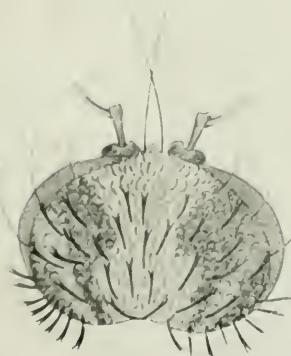
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